the congregation when Dr. Douglas preached his sermon. Marcus Benjamin

THE MANUFACTURE OF APPARATUS AND CHEMICALS

To the Editor of Science: It has often occurred to me that it would be beneficial to science if some of the large universities of this country would cooperate to build a factory where chemicals and apparatus would be manufactured and sold to the various scientific institutions at a correct margin of profit. Perhaps the Rockefeller or Carnegie Foundation could be interested in such a project. The majority of fellow investigators and university professors would welcome such an arrangement, for it would make material accessible which is difficult to obtain otherwise and might be an important source of instruction to industrial chemists and physicists.

Louis Baumann

The State University of Iowa

LORD LISTER ON THE VALUE OF VIVISECTION

To the Editor of Science: In reference to the letter from Lord Lister to myself published in Science of March 30, 1917, I beg leave to make this explanation. Recently the original copy of this letter has been found. It is dated 12 Park Crescent, Portland Place, London, West, 4th of April, 1898, and addressed to myself. Just after its receipt I handed it to a friend to use in connection with the hearing before the United States Senate on the Gallinger Bill relating to animal experimentation in the District of Columbia. My friend presented it at the hearing and it is published in the pamphlet relating to that hearing.

When Sir Rickman Godlee sent me a copy of the "rough draft" of this letter not long ago, saying if it had been received he would like to publish it in his "Life of Lord Lister," I went with great care over all of my letters and could not find the original. As it was almost a score of years since it had been received I had quite forgotten it and came to the conclusion that either it had gone astray in the mails or had never been sent. It has been returned to me and I have placed it in the Library of the College of Physicians of Philadelphia. W. W. Keen

Philadelphia, Pa.,
March 31, 1917

QUOTATIONS

THE AMERICAN ASSOCIATION AND WORK IN AGRICULTURE

The annual meeting of the American Association for the Advancement of Science is one of the great scientific events of the year. It is a vast clearinghouse for ideas and results in science, and for the testing and molding of views. It presents the largest forum in this country for healthy, tempered but searching criticism in science, without which science becomes self-complacent, lax and unexacting in its requirements.

Beyond this, such a meeting of men associated with the various branches of science has a remarkably broadening influence. One gets new insight, suggestion and inspiration from such a contact of minds, such a presentation of evidence, such a weighing and testing of results and of views. The individual finds anew that his branch of science or his specialty has relations beyond the narrow limits in which he has been considering it, and that there is not only an interest in following this broader relation, but a danger unless he does that he may specialize too closely in his thinking and view his subject out of focus.

Hence it seems worth while for the man of science to foregather from time to time with his colleagues in the annual convocation, worth the time and worth the money outlay. This is not so much to listen to papers which might be read or to present a report which might be published, but to keep his mind from narrowing, to maintain a contact with science which is well nigh impossible otherwise, and an association which contributes so much to the zeal and the satisfaction of a scientific career. It brings him definitely into membership in that great fraternity of workers in the broad field of science—some for its own sake, some for its relations to human welfare, all having the common purpose to advance knowledge and understanding. It was the belief in such advantages that led thousands of men and women to jour-

ney long distances, many from the south and the west, to attend the New York meeting.

The relation to agriculture of considerable parts of the programs of various sections and affiliated societies seems increasingly greater with each succeeding meeting. Perhaps it is because our interest is broadening. Perhaps it is because the investigation in agriculture is leading more and more deeply into the realm of the sciences. And undoubtedly it is because interest in these problems is becoming more widespread, for the problems of agriculture are now attracting the attention of very many men and women identified with nonagricultural institutions. The biological chemists, the various botanical organizations, the entomologists, the zoologists, the geneticists, the ecologists, all had papers of immediate import to agricultural investigation. Indeed, there were so many of these contributions and discussions that the difficulty was to hear more than a small part and to make a selection.—*Experiment Station Record.*

SCIENTIFIC BOOKS

Plant Succession. An Analysis of the Development of Vegetation. By FREDERIC E. CLEMENTS, Carnegie Institution of Washington, Publication Number 242, Washington, D. C., 1916. Pp. xiii + 512, 61 half tone plates of two to three figures each, and 51 figures in the text.

For nearly a quarter of a century the author of this large and attractive volume has been investigating numerous problems in the field of phyto-ecology and related subjects as he has found them in the great out-of-door laboratory of western United States. This area is particularly stimulating for such work since so many of the natural life phenomena have been preserved to the present in nearly their original conditions. During these years the author has been favored with unusual facilities for the conduction of his investigations. Because of these facts, as well as because of the well-known leadership which American ecologists enjoy, this latest work from Clements will attract the attention of botanists and biologists in general throughout the world.

The reader must understand that this work is not in any sense a treatise on general plant ecology. It represents a careful examination of the facts and principles of plant succession, an analysis of the development of vegetation in the past as well as the present, together with a digest of the methods for investigating successional phenomena.

The subject-matter of the monograph is arranged in fifteen subdivisions or chapters. In Chapter I. the author rewrites his rather familiar views as to the fundamental nature and causes of succession. He points out that "the developmental study of vegetation rests upon the assumption that the unit or climax formation is an organic entity." As a living entity this unit arises, develops, matures and eventually disappears. All such entities or formations develop as a result of succession which may occur again and again in the history of each climax unit. The most striking external feature of succession lies "in the movement of populations, the waves of invasion, which rise and fall through the habitat from initiation to climax."

An excellent historical summary beginning with King (1685) and including the work of twentieth century ecologists is included in Chapter II. This is a valuable summary of the concepts that have helped in shaping modern ideas with regard to plant succession.

Then follows a long chapter on the causes of succession. "Initial causes" are discussed under the captions: Topographic Causes, Erosion, Deposit, Elevation and Subsidence, Edaphic Causes, Climatic Causes, Biotic Causes, while "ecesic causes" are enumerated as Aggregation, Migration, Ecesis, Competition and Invasion. This chapter is followed by a study of stabilization and the development of the final or climax community.

The structure and units of vegetation are treated at length and the views of various ecologists upon these subjects summarized. One of the most interesting, as perhaps most valuable, parts of the book is the attempt of the author to focus attention more sharply than has ever been done before upon the fact that plant communities may and should be